查询AZ1084D-1.5供应商

Advanced Analog Circuits

Data Sheet

5A LOW DROPOUT LINEAR REGULATOR AZ1084

General Description

The AZ1084 is a series of low dropout positive voltage regulators with a maximum dropout of 1.5V at 5A of load current.

The series features on-chip thermal limiting which provides protection against any combination of overload and ambient temperatures that would create excessive junction temperatures. It also includes a trimmed bandgap reference and a current limiting circuit.

The AZ1084 is available in 1.5V, 1.8V, 2.5V, 2.85V, 3.3V and 5.0V versions. The fixed versions integrate the adjust resistors. It is also available in an adjustable version which can set the output voltage with two external resistors.

The AZ1084 series is available in standard packages of TO-263-2, TO-263-3, TO-220 and TO-252.

Features

- Low Dropout Voltage: 1.3V Typically at 5A
- Current Limiting and Thermal Protection
- Output Current: 5A
- Current Limit: 6.5A
- Operating Junction Temperature Range:0 to 125^{o}C
- Line Regulation: 0.015% (Typical)
- Load Regulation: 0.2% (Typical)

Applications

- High Efficiency Linear Regulators
- Battery Chargers
- Post Regulation for Switching Supply
- Microprocessor Supply
- Desktop PCs, RISC and Embedded Processors' Supply

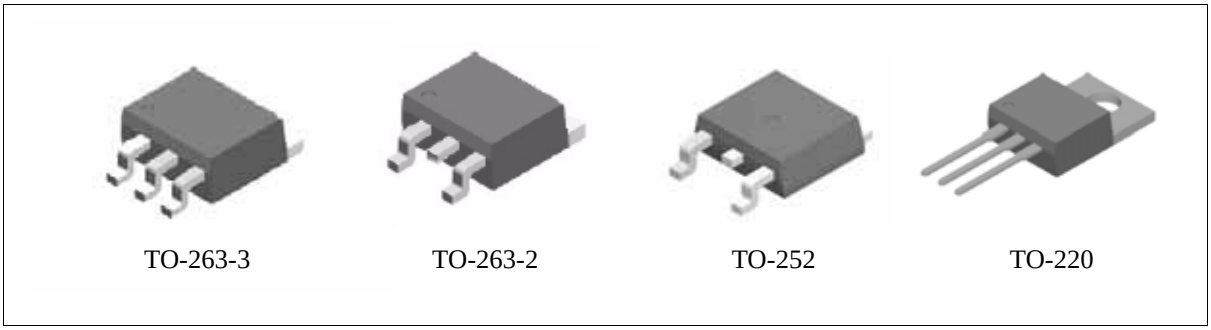
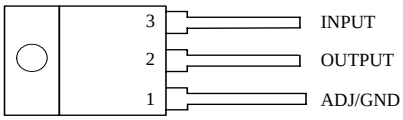


Figure 1. Package Types of AZ1084

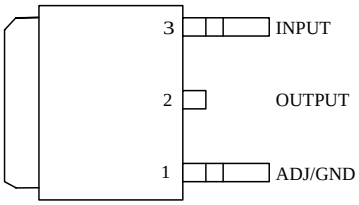
5A LOW DROPOUT LINEAR REGULATOR AZ1084

Pin Configuration

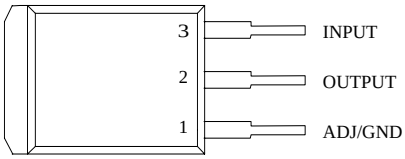
T Package
(TO-220)



D Package
(TO-252)



S Package
(TO-263-3)



S Package
(TO-263-2)

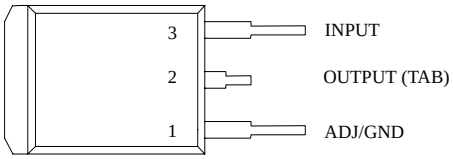


Figure 2. Pin Configuration of AZ1084 (Top View)

Functional Block Diagram

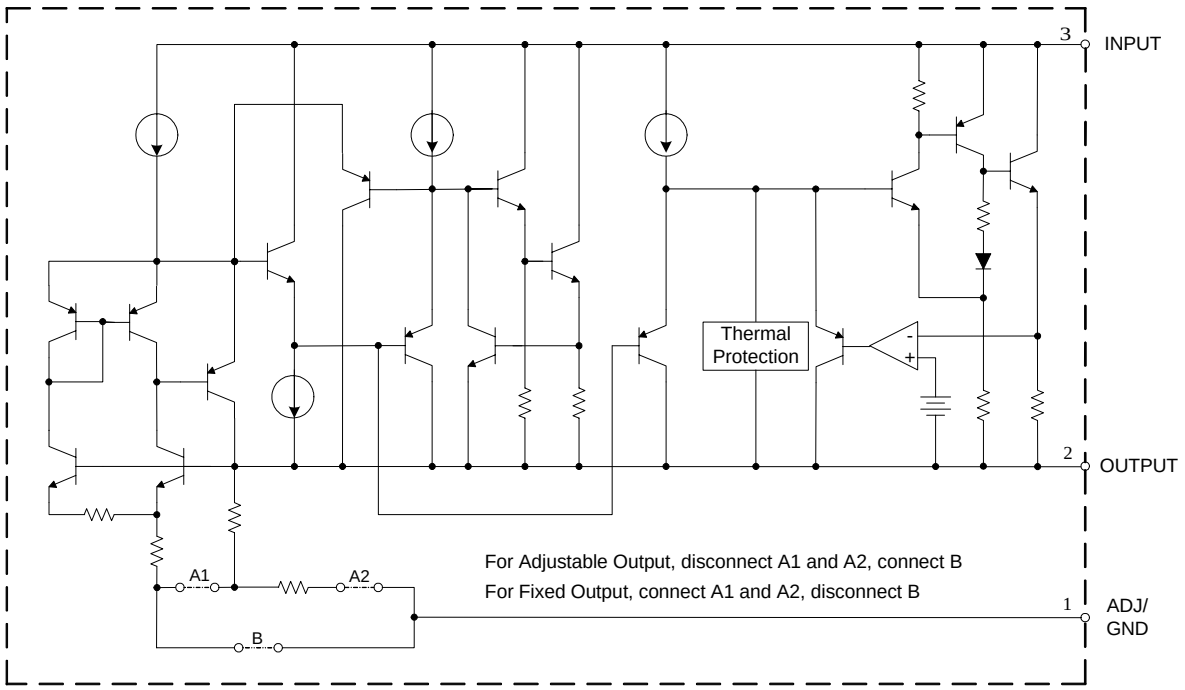
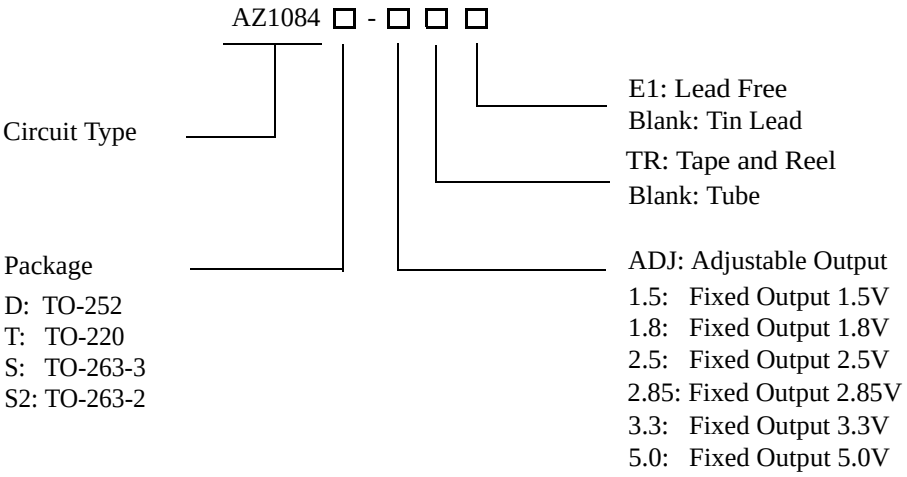


Figure 3. Functional Block Diagram of AZ1084

5A LOW DROPOUT LINEAR REGULATOR AZ1084

Ordering Information



Package	Temperature Range	Part Number		Marking ID		Packing Type
		Tin Lead	Lead Free	Tin Lead	Lead Free	
TO-252	0 to 125°C	AZ1084D-ADJ	AZ1084D-ADJE1	AZ1084D-ADJ	AZ1084D-ADJE1	Tube
		AZ1084D-ADJTR	AZ1084D-ADJTRE1	AZ1084D-ADJ	AZ1084D-ADJE1	Tape & Reel
		AZ1084D-1.5	AZ1084D-1.5E1	AZ1084D-1.5	AZ1084D-1.5E1	Tube
		AZ1084D-1.5TR	AZ1084D-1.5TRE1	AZ1084D-1.5	AZ1084D-1.5E1	Tape & Reel
		AZ1084D-1.8	AZ1084D-1.8E1	AZ1084D-1.8	AZ1084D-1.8E1	Tube
		AZ1084D-1.8TR	AZ1084D-1.8TRE1	AZ1084D-1.8	AZ1084D-1.8E1	Tape & Reel
		AZ1084D-2.5	AZ1084D-2.5E1	AZ1084D-2.5	AZ1084D-2.5E1	Tube
		AZ1084D-2.5TR	AZ1084D-2.5TRE1	AZ1084D-2.5	AZ1084D-2.5E1	Tape & Reel
		AZ1084D-2.85	AZ1084D-2.85E1	AZ1084D-2.85	AZ1084D-2.85E1	Tube
		AZ1084D-2.85TR	AZ1084D-2.85TRE1	AZ1084D-2.85	AZ1084D-2.85E1	Tape & Reel
		AZ1084D-3.3	AZ1084D-3.3E1	AZ1084D-3.3	AZ1084D-3.3E1	Tube
		AZ1084D-3.3TR	AZ1084D-3.3TRE1	AZ1084D-3.3	AZ1084D-3.3E1	Tape & Reel
		AZ1084D-5.0	AZ1084D-5.0E1	AZ1084D-5.0	AZ1084D-5.0E1	Tube
		AZ1084D-5.0TR	AZ1084D-5.0TRE1	AZ1084D-5.0	AZ1084D-5.0E1	Tape & Reel
TO-220	0 to 125°C	AZ1084T-ADJ	AZ1084T-ADJE1	AZ1084T-ADJ	AZ1084T-ADJE1	Tube
		AZ1084T-1.5	AZ1084T-1.5E1	AZ1084T-1.5	AZ1084T-1.5E1	Tube
		AZ1084T-1.8	AZ1084T-1.8E1	AZ1084T-1.8	AZ1084T-1.8E1	Tube
		AZ1084T-2.5	AZ1084T-2.5E1	AZ1084T-2.5	AZ1084T-2.5E1	Tube
		AZ1084T-2.85	AZ1084T-2.85E1	AZ1084T-2.85	AZ1084T-2.85E1	Tube
		AZ1084T-3.3	AZ1084T-3.3E1	AZ1084T-3.3	AZ1084T-3.3E1	Tube
		AZ1084T-5.0	AZ1084T-5.0E1	AZ1084T-5.0	AZ1084T-5.0E1	Tube

Ordering Information (Continued)

Package	Tempera-ture Range	Part Number		Marking ID		Packing Type
		Tin Lead	LeadFree	Tin Lead	LeadFree	
TO-263-3	0 to 125°C	AZ1084S-ADJ	AZ1084S-ADJE1	AZ1084S-ADJ	AZ1084S-ADJE1	Tube
		AZ1084S-ADJTR	AZ1084S-ADJTRE1	AZ1084S-ADJ	AZ1084S-ADJE1	Tape & Reel
		AZ1084S-1.5	AZ1084S-1.5E1	AZ1084S-1.5	AZ1084S-1.5E1	Tube
		AZ1084S-1.5TR	AZ1084S-1.5TRE1	AZ1084S-1.5	AZ1084S-1.5E1	Tape & Reel
		AZ1084S-1.8	AZ1084S-1.8E1	AZ1084S-1.8	AZ1084S-1.8E1	Tube
		AZ1084S-1.8TR	AZ1084S-1.8TRE1	AZ1084S-1.8	AZ1084S-1.8E1	Tape & Reel
		AZ1084S-2.5	AZ1084S-2.5E1	AZ1084S-2.5	AZ1084S-2.5E1	Tube
		AZ1084S-2.5TR	AZ1084S-2.5TRE1	AZ1084S-2.5	AZ1084S-2.5E1	Tape & Reel
		AZ1084S-2.85	AZ1084S-2.85E1	AZ1084S-2.85	AZ1084S-2.85E1	Tube
		AZ1084S-2.85TR	AZ1084S-2.85TRE1	AZ1084S-2.85	AZ1084S-2.85E1	Tape & Reel
		AZ1084S-3.3	AZ1084S-3.3E1	AZ1084S-3.3	AZ1084S-3.3E1	Tube
		AZ1084S-3.3TR	AZ1084S-3.3TRE1	AZ1084S-3.3	AZ1084S-3.3E1	Tape & Reel
		AZ1084S-5.0	AZ1084S-5.0E1	AZ1084S-5.0	AZ1084S-5.0E1	Tube
		AZ1084S-5.0TR	AZ1084S-5.0TRE1	AZ1084S-5.0	AZ1084S-5.0E1	Tape & Reel
TO-263-2	0 to 125°C	AZ1084S2-ADJ	AZ1084S2-ADJE1	AZ1084S2-ADJ	AZ1084S2-ADJE1	Tube
		AZ1084S2-ADJTR	AZ1084S2-ADJTRE1	AZ1084S2-ADJ	AZ1084S2-ADJE1	Tape & Reel
		AZ1084S2-1.5	AZ1084S2-1.5E1	AZ1084S2-1.5	AZ1084S2-1.5E1	Tube
		AZ1084S2-1.5TR	AZ1084S2-1.5TRE1	AZ1084S2-1.5	AZ1084S2-1.5E1	Tape & Reel
		AZ1084S2-1.8	AZ1084S2-1.8E1	AZ1084S2-1.8	AZ1084S2-1.8E1	Tube
		AZ1084S2-1.8TR	AZ1084S2-1.8TRE1	AZ1084S2-1.8	AZ1084S2-1.8E1	Tape & Reel
		AZ1084S2-2.5	AZ1084S2-2.5E1	AZ1084S2-2.5	AZ1084S2-2.5E1	Tube
		AZ1084S2-2.5TR	AZ1084S2-2.5TRE1	AZ1084S2-2.5	AZ1084S2-2.5E1	Tape & Reel
		AZ1084S2-2.85	AZ1084S2-2.85E1	AZ1084S2-2.85	AZ1084S2-2.85E1	Tube
		AZ1084S2-2.85TR	AZ1084S2-2.85TRE1	AZ1084S2-2.85	AZ1084S2-2.85E1	Tape & Reel
		AZ1084S2-3.3	AZ1084S2-3.3E1	AZ1084S2-3.3	AZ1084S2-3.3E1	Tube
		AZ1084S2-3.3TR	AZ1084S2-3.3TRE1	AZ1084S2-3.3	AZ1084S2-3.3E1	Tape & Reel
		AZ1084S2-5.0	AZ1084S2-5.0E1	AZ1084S2-5.0	AZ1084S2-5.0E1	Tube
		AZ1084S2-5.0TR	AZ1084S2-5.0TRE1	AZ1084S2-5.0	AZ1084S2-5.0E1	Tape & Reel

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant.

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Min	Max	Unit
Operating Junction Temperature Range	T_J		150	^oC
Storage Temperature Range	T_S	-65	150	^oC
Lead Temperature (Soldering, 10 sec.)	T_{LEAD}		300	^oC
ESD (Human Body Model)	ESD		2000	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under"Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Input Voltage	V_{IN}		12	V
Operating Junction Temperature Range	T_J	0	125	^oC

Electrical Characteristics

Typicals and limits appearing in normal type apply for $T_J = 25^oC$. Limits appearing in **Boldface** type apply over the entire operating junction temperature range.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reference Voltage	V_{REF}	AZ1084-ADJ, I_{OUT} = 10mA, V_{IN} -V_{OUT} = 3V, 10mA ≤ I_{OUT} ≤ 5A, 1.5V ≤ V_{IN} - V_{OUT} ≤ 5V	1.238 **1.225**	1.250 **1.250**	1.262 **1.270**	V
Output Voltage	V_{OUT}	AZ1084-1.5, I_{OUT} = 0mA, V_{IN} = 4.5V, 10mA≤ I_{OUT} ≤ 5A, 3.1V≤ V_{IN} ≤ 6V	1.485 **1.47**	1.5 **1.5**	1.515 **1.53**	V
		AZ1084-1.8, I_{OUT} = 0mA, V_{IN} = 4.8V, 10mA≤ I_{OUT} ≤ 5A, 3.4V≤ V_{IN} ≤ 6V	1.782 **1.764**	1.8 **1.8**	1.818 **1.836**	V
		AZ1084-2.5, I_{OUT} = 0mA, V_{IN} = 5.5V, 10mA≤ I_{OUT} ≤ 5A, 4.1V≤ V_{IN} ≤ 7V	2.475 **2.45**	2.5 **2.5**	2.525 **2.55**	V
		AZ1084-2.85, I_{OUT} = 0mA, V_{IN} = 6V, 10mA≤ I_{OUT} ≤ 5A, 4.5V≤ V_{IN} ≤ 8V	2.822 **2.793**	2.85 **2.85**	2.879 **2.907**	V
		AZ1084-3.3, I_{OUT} = 0mA, V_{IN} = 6.3V, 10mA≤ I_{OUT} ≤ 5A, 4.9V≤ V_{IN} ≤ 8V	3.267 **3.234**	3.3 **3.3**	3.333 **3.366**	V
		AZ1084-5.0, I_{OUT} = 0mA, V_{IN} = 8V, 10mA≤ I_{OUT} ≤ 5A, 6.6V≤ V_{IN} ≤ 10V	4.95 **4.9**	5 **5**	5.05 **5.1**	V
Line Regulation	ΔV_{OUT}	AZ1084-ADJ, I_{OUT} = 10mA, 2.85V ≤ V_{IN} ≤ 10V		0.015 **0.035**	0.2 **0.2**	%
		AZ1084-1.5, I_{OUT} = 10mA, 3.1V ≤ V_{IN} ≤ 10V		0.5 **1**	6 **6**	mV
		AZ1084-1.8, I_{OUT} = 10mA, 3.4V ≤ V_{IN} ≤ 10V		0.5 **1**	6 **6**	mV
		AZ1084-2.5, I_{OUT} = 10mA, 4.1V ≤ V_{IN} ≤ 10V		0.5 **1**	6 **6**	mV
		AZ1084-2.85, I_{OUT} = 10mA, 4.5V ≤ V_{IN} ≤ 10V		0.5 **1**	6 **6**	mV
		AZ1084-3.3, I_{OUT} = 10mA, 4.9V ≤ V_{IN} ≤ 10V		0.5 **1**	6 **6**	mV
		AZ1084-5.0, I_{OUT} = 10mA, 6.6V ≤ V_{IN} ≤ 10V		0.5 **1**	10 **10**	mV

Electrical Characteristics (Continued)

Typicals and limits appearing in normal type apply for $T_J = 25^oC$. Limits appearing in **Boldface** type apply over the entire operating junction temperature range.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Load Regulation	ΔV_{OUT}	AZ1084-ADJ, 0mA≤ I_{OUT} ≤ 5A, V_{IN} - V_{OUT} = 3V		0.1 **0.2**	0.3 **0.4**	%
		AZ1084-1.5, 0mA≤ I_{OUT} ≤ 5A, V_{IN} - V_{OUT} = 3V		3 **7**	15 **20**	mV
		AZ1084-1.8, 0mA≤ I_{OUT} ≤ 5A, V_{IN} - V_{OUT} = 3V		3 **7**	15 **20**	mV
		AZ1084-2.5, 0mA≤ I_{OUT} ≤ 5A, V_{IN} - V_{OUT} = 3V		3 **7**	15 **20**	mV
		AZ1084-2.85, 0mA≤ I_{OUT} ≤ 5A, V_{IN} - V_{OUT} = 3V		3 **7**	15 **20**	mV
		AZ1084-3.3, 0mA≤ I_{OUT} ≤ 5A, V_{IN} - V_{OUT} = 3V		3 **7**	15 **20**	mV
		AZ1084-5.0, 0mA≤ I_{OUT} ≤ 5A, V_{IN} - V_{OUT} = 3V		5 **10**	20 **35**	mV
Dropout Voltage		I_O = 5A, ΔV_{REF},ΔV_{OUT}= 1%		1.3	1.5	V
Current Limit	I_{LIMIT}	V_{IN} - V_{OUT} = 3V,	5.5	6.5		A
Minimum Load Current		V_{IN} = 10V (AZ1084-ADJ)		**3**	**10**	mA
Quiescent Current		V_{IN} = 10V (AZ1084)		**5**	**10**	mA
Ripple Rejection		f_{RIPPLE} = 120Hz, C_{OUT} = 25μF Tantalum, I_{OUT} = 5A, V_{IN} - V_{OUT} = 3V	**60**	**72**		dB
Adjust Pin Current		V_{IN} = 4.25V, I_{OUT} = 10mA		55	**120**	μA
Adjust Pin Current Change		10mA ≤ I_{OUT} ≤ 5A, 1.5V≤ (V_{IN} -V_{OUT}) ≤ 4.5V		**0.2**	**5**	μA
Temperature Stability		I_{OUT} = 10mA, V_{IN} - V_{OUT} = 1.5		**0.5**		%
Long Term Stability		T_A = 125°C, 1000Hrs		0.5		%
RMS Noise (% of V_{OUT})		10Hz ≤ f ≤ 10kHz		0.003		%
Thermal Resistance Junction -to-Case	θ_{JC}	TO-263 TO-220 TO-252		3 3 4		°C/W

Typical Performance Characteristics

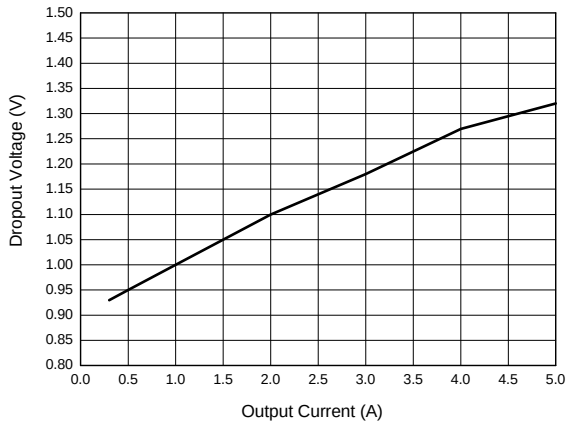


Figure 4. Dropout Voltage vs. Output Current

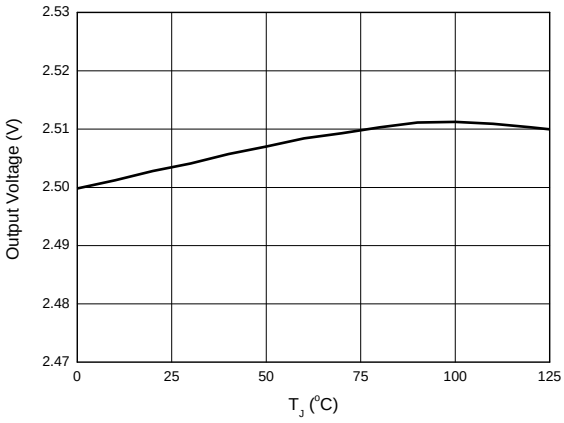


Figure 5. Output Voltage vs. Temperature

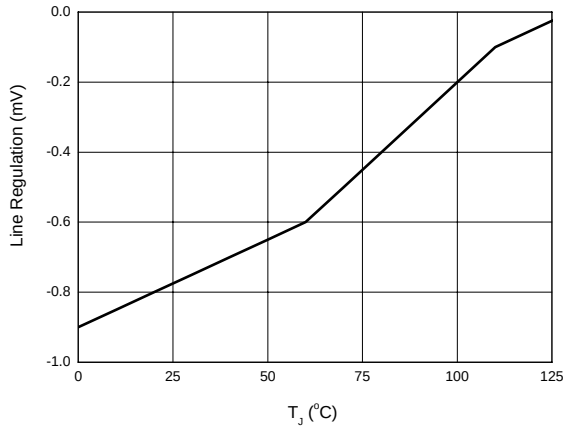


Figure 6. Line Regulation vs. Temperature

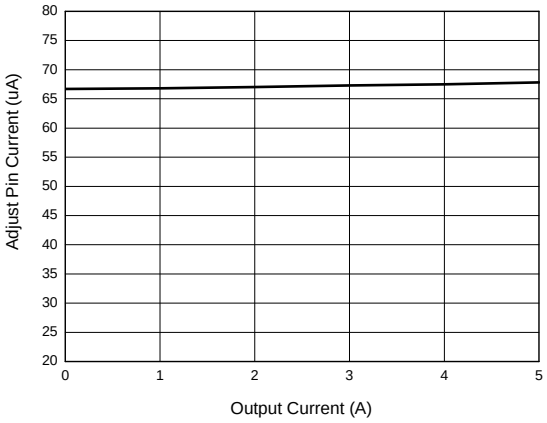


Figure 7. Adjust Pin Current vs. Output Current

Typical Performance Characteristics (Continued)

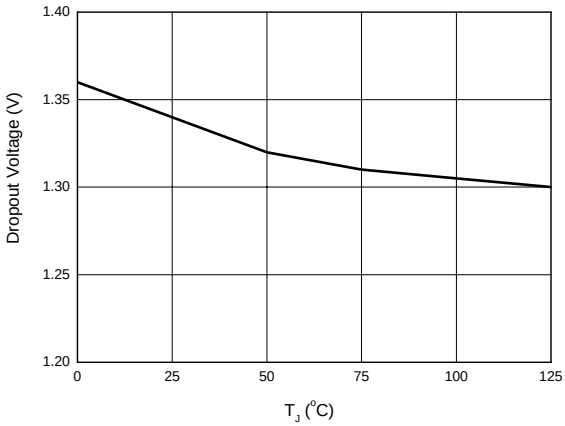


Figure 8. Dropout Voltage vs. Temperature

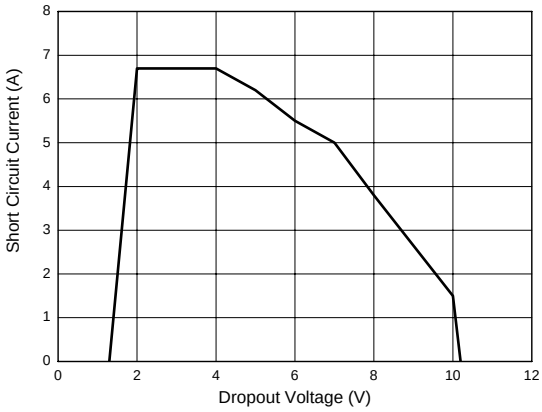


Figure 9. Short Circuit Current vs. Dropout Voltage

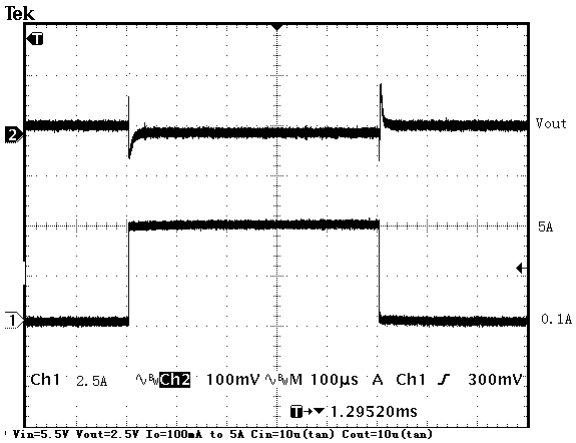


Figure 10. Load Transient Response

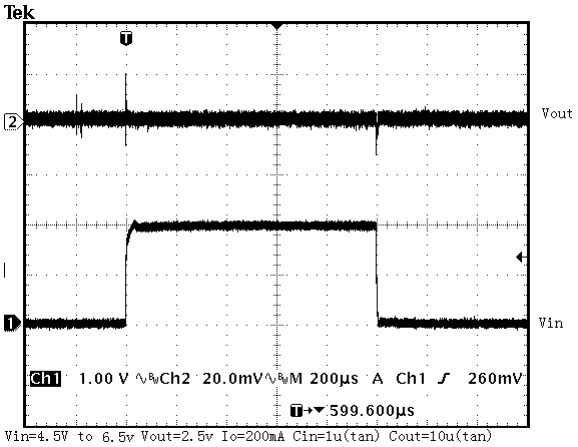


Figure 11. Line Transient Response

Typical Application

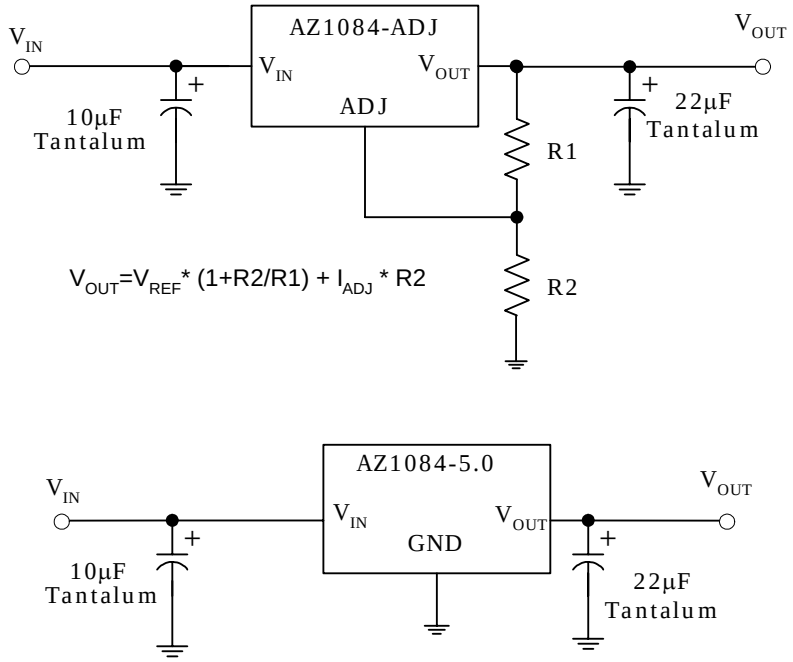
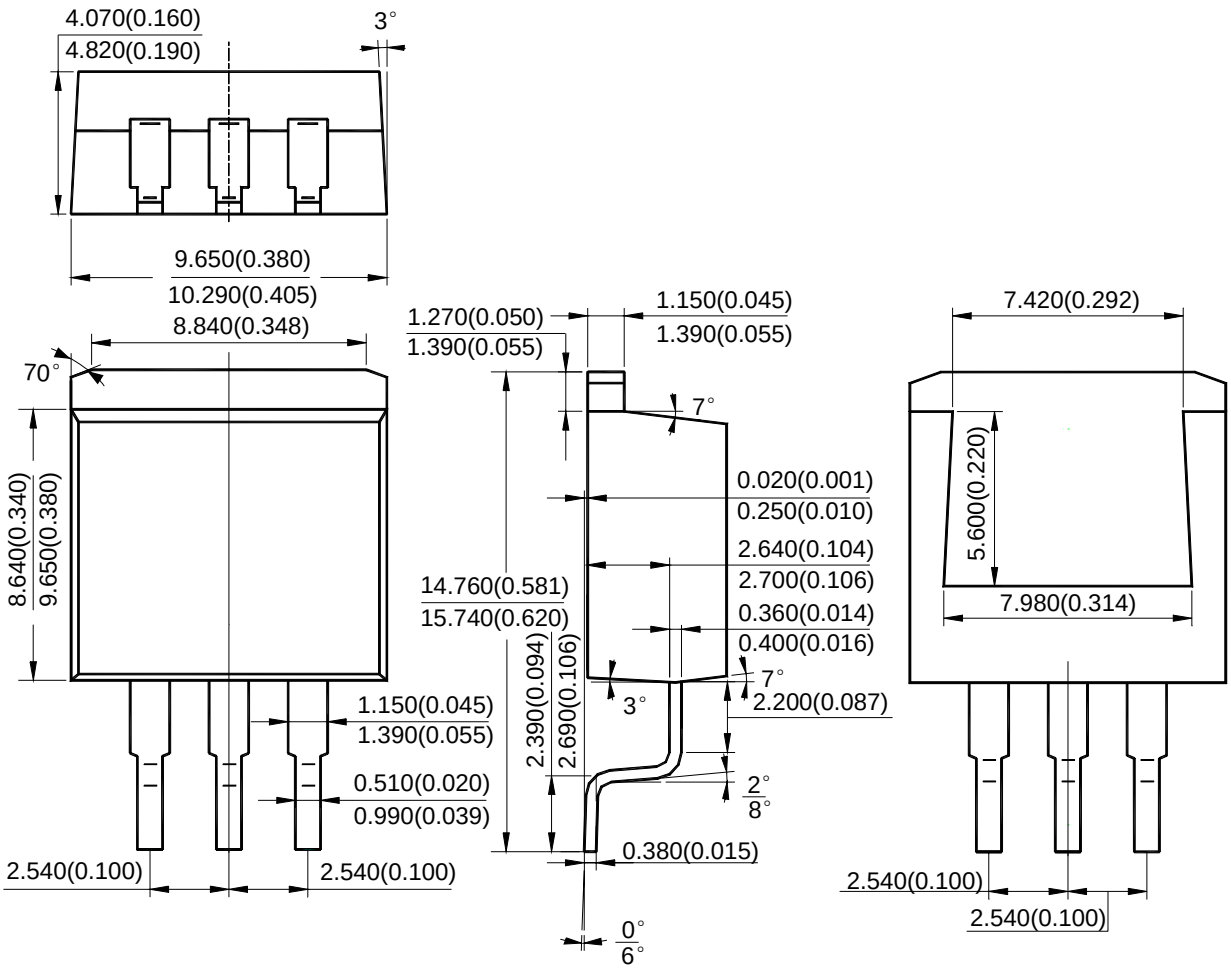


Figure 12. Typical Applications of AZ1084

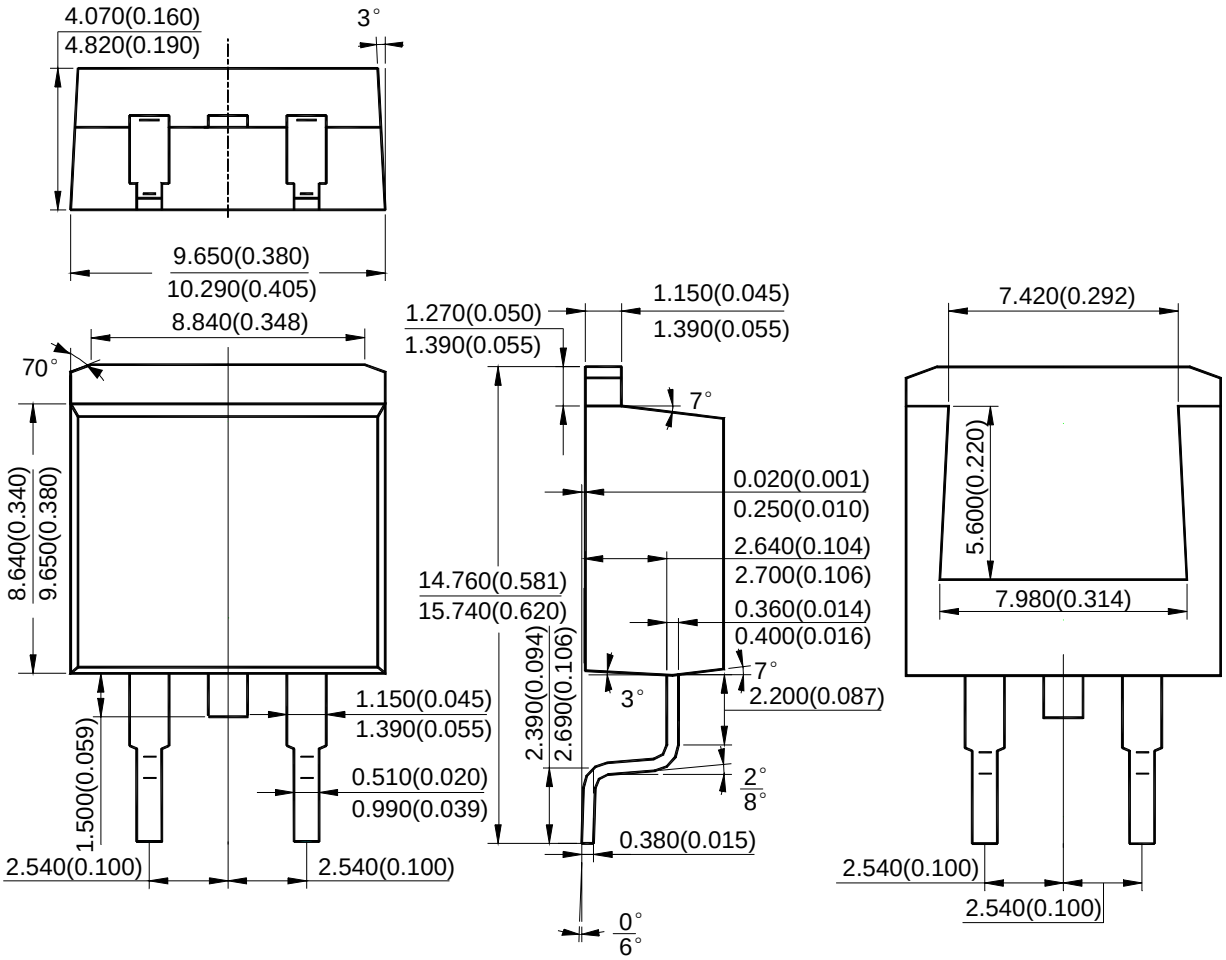
Mechanical Dimensions

TO-263-3 **Unit: mm(inch)**



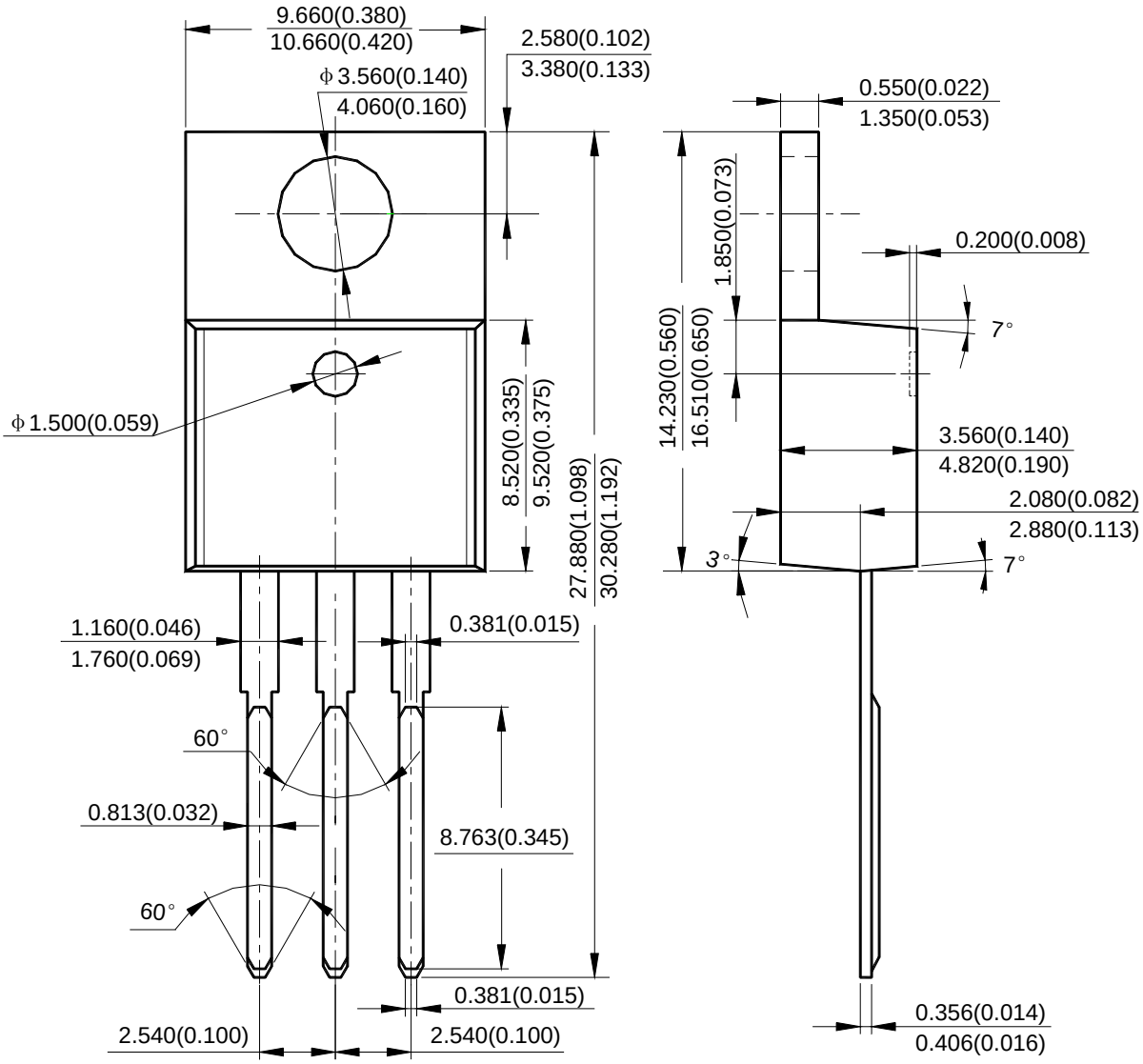
Mechanical Dimensions (Continued)

TO-263-2 **Unit: mm(inch)**



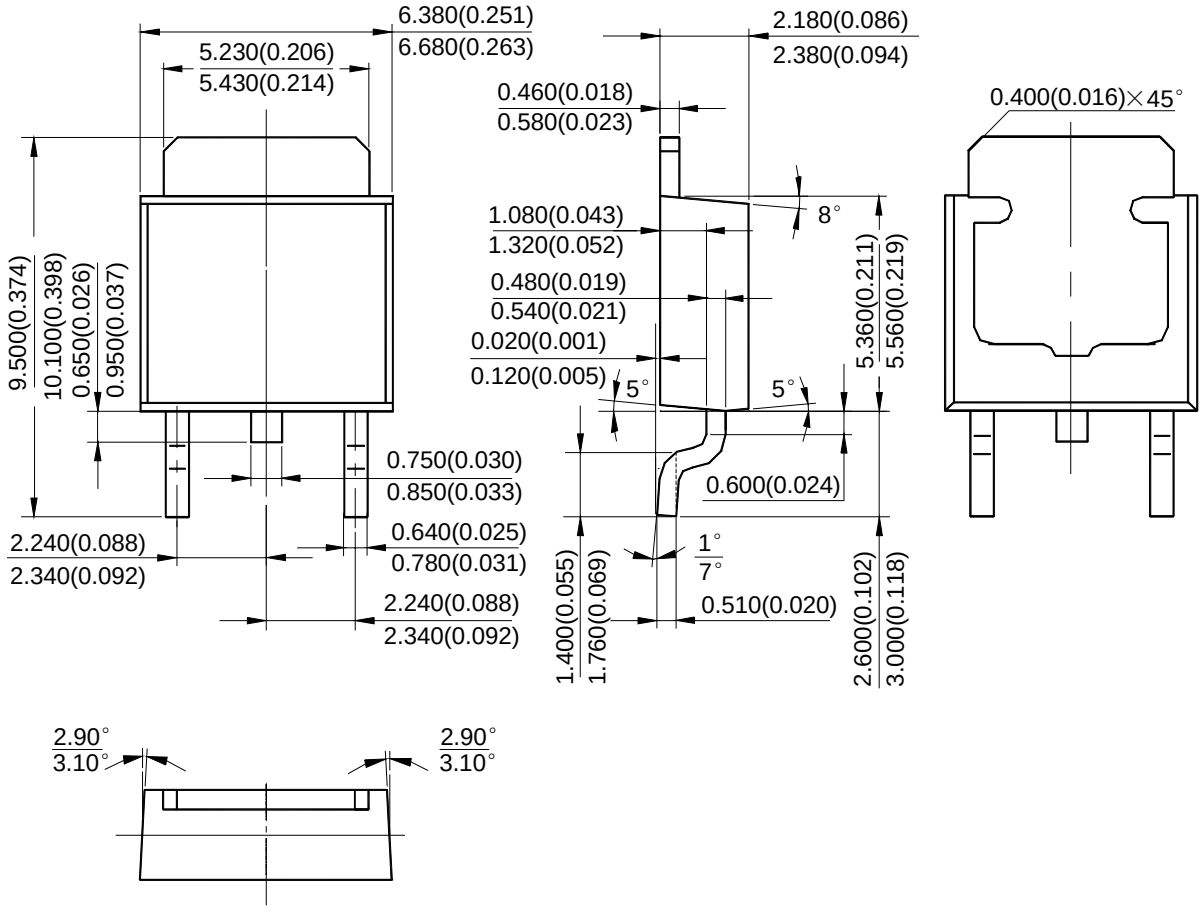
Mechanical Dimensions (Continued)

TO-220 **Unit: mm(inch)**



Mechanical Dimensions (Continued)

TO-252 **Unit: mm(inch)**



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